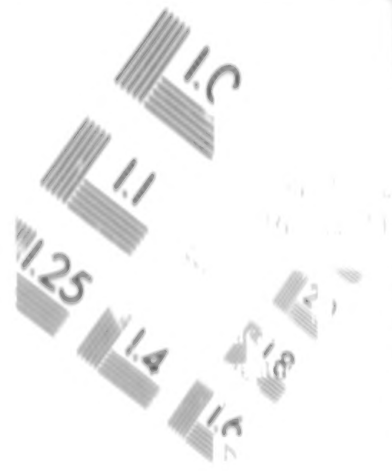


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Sciences
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This was how events developed. Measurements were taken when it was already known that the accident had occurred over Bulgaria's territory, within the night of May 1 to May 2. The Central Hydrology and Meteorology Academy of the Bulgarian Academy of Sciences and the rise in radioactivity. The data were obtained from several hundred to sev-

Then drinking water began to
"hot particles" were detected
concentration exceeded the
sands-fold.

Measurements, taken on a showed an on-ground conta Becquerels per square meter ination in southern Bulgari 1,700-fold the usual values between 90 and 1,400-fold.

Some fifteen radionuclides
ferent samples: iodine 131
137, strontium, barium and

On May 5 the Central Laboratory for Protection and Toxicology established a record in sheep's milk exceeding the maximum permitted concentration of 500 Becquerels per

In a sample of milk the So
sured a concentration of up
litre.

But almost no measures were taken for decontamination. Precaution measures were taken in the Army. Examinations made in the city of Varna (northern Bulgaria) showed that the thyroid gland of soldiers was contaminated with iodine. The thyroid gland of soldiers that in the case of schoolch-

Secondary radioactive cont.
when farm animals began
fodder.

At the beginning of May 19 men of the 19-30 age-group kilo. In March-April the fo to 320 Becquerels as a resi nated foodstuffs.

According to UN data Bulgaria has the highest rate of thyroid cancer among European countries containing no iodine in the diet. But through the efforts of the Bulgarian authorities now the iodine content in the thyroid has increased and by its caesium radioac-

This folly has a material e
suffered damages to the tur
600 thousand leva. But th
surable....

mass-produced surface-to-surface paper said.

last 18 batteries, including three even battalions for the missile-complete defense against Scud.

million to 300 million U.S. dollars the money in more economic improve its defense capabilities.

it being trimmed, Seoul finds it purchase the missiles, it said.

he missiles hit 80 percent to 90 percent in the Gulf war were wrong, and the success rate was a 50 percent to 60 percent. Major damage from debris even in the worst case, the paper said.

likely to use short-range missiles in attack on the South because of the risk of losing them, the local daily said.

reports based on government
able of producing more than 50
and has at least 12 launchers
ine. They are reportedly capable
chemical warheads.

10

Paragraph 4

In the framework of perfect authority, the OAB:

Grants licenses for the erection, renovation, and shutdown based on permits granted required in separate law.

Paragraph 5

In the interest of performing its duties, the OAB cooperates with all ministries and agencies of national scope involved in the energy sector. The OAB informs the government of its decisions related to the use of energy.

Paragraph 6

The OAB streamlines research and management work related to the state's nuclear security and directs state research and development to nuclear security.

Paragraph 7

1. In the framework of its functions, the OAB monitors:
 - a) The peaceful use of national economy.
 - b) The enforcement of discipline of authority relative to the national economy.
2. In the interest of performance, the OAB may examine, or make recommendations to, the divisions involved in the performance of its functions.
3. Based on findings respecting control functions, the OAB calls the attention of leaders of a national scope and of the public to changes in prescriptions and in each case reports to the public on its findings.

Paragraph 8

The OAB maintains relations with regional organizations which have jurisdiction of nuclear energy; develops multilateral international relations; exercises jurisdiction. The OAB coordinates the work of the IAEA and Hungary's participation stemming from international authority granted in other fields. From such authority, the OAB's implementation of bilateral agreements, in cooperation with the leaders of organizations.

Owing to all these hazards question: can't we do what the West, perceptions are changed for atomic reactors have deferred. Many States in commissioning of already plants. In Sweden, where been most successful, a which resulted in the d power by the year 2010. I opponents of nuclear pov pleted power reactor (Zw line. In Spain, five react started have been with programme.

Can a poor country like P already spending a subs resources on developme would be appropriate to p what the nuclear people

The nuclear option shou ally debated. To stimulat in this issue interview Chairman of the Pakista as well as a physicist, a g cum-politician. There is physicist Dr Pervez Ho University, Islamabad, Award.

AEC Chairman I

91WP0084B Lahore VIE
pp 16-18

[Interview with Munir A stan Atomic Energy C About the Bomb"; date

[Text] Mr Munir Ahm Pakistan Atomic Energy "irresponsible articulati done irreparable damage

In an interview in Islam about the bomb has wor

The interview was arra Ahmad Khan's visits t spacious office at the F bad. One of the main standards of health and s Munir Ahmad Khan sai

Two years ago, there w KANUPP. Thirty-six to the chamber underneal immediately recovered the reactor. Our losses purification were of the radioactivity was relea

THE NUCLEAR OPTION IN PAKISTAN

Dr Pervez Hossain
Chairman, Pakistan Atomic Energy Commission
Islamabad

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center at Saclay. "On the basis of nderground and surface areas contaminated that the amount of mud 2,000 tons of predried materials," S/IN2P3 (National Institute of Physics) claim in a joint bulletin.

, the 2,000 tons of mud contain .22 mg of cesium 137, 20 billionths of maller traces of a large number of nents, including radium 226 (at a um 90 (discovered in three sam-st active point of the terrain), m. The measure of aerosols shows ivity into the atmosphere.

y in the Paris region exposes its ivalent of 1.5 millisieverts (mSv) a culations of the National Institute and Safety (IPSN), a person living e 24 hours a day would receive an alent to .6 mSv/year. The sum of esponds to an average equivalent iv/year," experts conclude. Results awarded to the prefect of Essonne ed reports."

Accelerator Developed IENCES & AVENIR in French

of, Jacques Pottier and developed Electronics and Instrumentation omic Energy Commission (CEA), ype is the first European particle rial use.

ic principle: An alternating elec-ccelerate the electrons while large aths. Injected into a coaxial cavity al field, the electrons accelerate. oundary of the accelerator cavity, etic field oblige them to make a to the cavity, they reach a higher t. The process is repeated exactly ulation principle makes electrons d, or, for non-Hellenists, rose-rticle beam originating from the ut 3.3 Mev of energy or enough to instance.

s, in so far as it is possible, the try: It takes up a mere eight square a; with certain modifications, it a simple push button apparatus. principle makes it economical to re considering selling it for 6.5

option. If you retain this nu other countries who have assist only the NPT signat reactor. The constraint is p the nuclear option we ha ation. This time we have p our nuclear policy. Now makes political policy of tl

[VIEWPOINT] What do y ements about our nuclear p

[Khan] I think one of the gr in our country is the irre nuclear policy. It has don credibility. Too much talk many enemies abroad. The dissuade governments and opinion against Pakistan. countries agree to co-oper difficulty that we convinc continue talking about the relations with other counti

[VIEWPOINT] What is th tors that the previous gove

[Khan] I think that the Gu tion of Kuwait have given relations that nobody has h Once this issue is settled, s

[VIEWPOINT] This mean has been upset.

[Khan] Yes. It has been u was that by 1991, we shou tion was to be completed about \$1,400 million. The down because of the cons Anyhow, the initial cost would be profitable the ne

[VIEWPOINT] The nucle the Government wants to tial?

[Khan] This means that v selves. Retaining the optic making the bomb. It is tha up the option and we will Non-proliferation Treaty, about signing it.

[VIEWPOINT] The argun favour of nuclear energy industrial development. Tl met beside installation o questions related to indus one—what industry will markets, the quality of other established countries how in Pakistan.

The contracts concluded by Mercedes contain the term "noncivilian version" at various points. All tractor trucks are fitted with "sleuable roof opening" on the side of the co-driver.

This means something to experts. For years the war ministry in Baghdad ordered sand-colored trucks with roof openings for submachine guns. The 26 Mercedes-Marrel vehicles were also ordered with "special matte sand-colored coating."

According to the Daimler managers, the roof opening cannot be seen as proof of the military use of the trucks. Round holes are also cut into civilian vehicles. For submachine gun stands the roof must be more stable than normal roofs. However, this was not the case with the trucks for Iraq.

Even with small details, such as the trailer coupling, the customer from the Middle East accorded great value to the correct equipment. The contract clearly speaks of "military type" equipment.

The secret services discovered some time ago that something was wrong with these deals. On 16 January, the Federal Intelligence Service (BND) drew the government's attention to the exports by the Stuttgart and Wuelfrath companies.

According to a confidential document, Marrel supplied trucks to Iraq "that might be used as launching platforms for surface-to-surface missiles," and which "presumably belong to Project 144," the Scud program. The tractor was produced by Daimler Benz and the flat-bed trailer by Marrel, the intelligence agents claimed.

One can proceed from the assumption that the final destination of the vehicles was covered up, "despite the fact that those involved must have known about the actual use."

Despite the clear references to the military version and the transportation of Scud-B missiles, the investigators might be facing difficulties. On the basis of the lax German laws, the prosecuting authority must now prove that the vehicles were constructed especially for military use in Iraq. References in contracts and drawings might not be sufficient.

However, the Iraqi deals and exports by the Mercedes concern to other Arab states might not be compatible with Reuter's noble principles.

The public prosecutors are investigating three export deals of the Stuttgart-based company, which are believed to have been carried without export permits. Thus, 85 3250-AS-type trucks were allegedly delivered to Kuwait, 150 3850-AS-type trucks to Abu Dhabi, and 70 trucks of the same type to Yemen.

Nobody will believe the arguments of the Mercedes managers that simple transport vehicles, suited for the transportation of harmless goods, were involved. The

investigators are in the possession of a brochure ("Mercedes-Benz Military Vehicles"), in which the range of military products is described in detail.

The standard Mercedes vehicles "have been modified for military purposes," the leaflet reads. It is exactly the models that Mercedes exported to Kuwait, the United Arab Emirates, and Yemen that are presented in the brochure as "Mercedes-Benz military vehicles."

There are numerous innuendos and accusations. At the moment, the investigators are busy emptying the crates with the confiscated files and examining the material. However, the suspicion—violation of the arms export law by the company, the illegal pocketing of commissions by individual employees—is a serious burden for the concern and has already damaged the reputation of the Mercedes-Benz automobile concern.

In view of this, the trip that the head of the Mercedes concern, Werner Niefer, made last Thursday [21 March] may have provided some consolation. Over 1,000 managers who were polled last fall by MANAGER MAGAZINE rated the auto manufacturer as the number one among the most renowned enterprises of the German industry.

At Hamburg's "Four Seasons" hotel, he received the prize "Image Profiles 91" with a mixture of pride and embarrassment.

Wismuth Radioactive Waste Removal Costs Reported

AU2803104591 Cologne Deutschlandfunk Network in German 1000 GMT 28 Mar 91

[Text] This year alone, the removal of the waste caused by the Soviet-German joint stock company, Wismuth, costs 830 million German marks. As the Federal Government reported in answer to a question from the Alliance 90/Greens group in parliament, this amount is above all intended for the disposal of the nuclear waste of the open uranium mines, in order to avoid the contamination of the ground water. Before the end of the year, the dismantling of the installations and the demolition of radioactively contaminated buildings will also be initiated, it was stated.

ITALY

Research on Nuclear Energy Intensified

Nuclear Energy Committee

91MI0178A ITALIA OGGI in Italian 10 Jan 91 p 33

[Interview with Professor Umberto Colombo, president of ENEA, by ITALIA OGGI; place not specified; first two paragraphs are ITALIA OGGI introduction]

[Text] Italy's energy bill is growing due to the Gulf crisis. While Italy acquires electricity and fuels abroad, safety

technology for atomic reactors is being refined and new techniques for the treatment of fission waste are being developed. A consortium has recently been established (Ansaldo, Fiat, ABB) to develop a more intrinsically and passively safe reactor.

In light of these new elements, has the time come for Italy to talk over nuclear energy again? We asked Professor Umberto Colombo, president of ENEA (National Committee for the Research and Development of Nuclear and Alternative Energies), the institute which oversees energy research in Italy. In brief, Colombo proposes exploring the whole sector.

Three Recipes: Savings, Coal, and Natural Gas

[Colombo] I believe that the Gulf crisis and the threat of future crises, the concern of the over heating of the Earth's atmosphere due to the greenhouse effect, and Italy's excessive dependence on imported energy, especially petroleum, will oblige us to adopt a well-defined energy strategy to recover from such a vulnerable situation. First, we must focus on saving energy by promoting less energy-intensive industrial production.

There should be a greater use of natural gas and carbon among the fossil fuels, so as not to produce more greenhouse gas than the current mix. We must also speed up the penetration of renewable energy sources, taking advantage of the high energy costs. Finally, nuclear research should be intensified. After the stall brought about by Chernobyl, this can return in Italy, with a new generation of reactors that can clearly be demonstrated as having a safe, reliable performance.

[ITALIA OGGI] Mention has been made of "safe" or "safer" reactors for some time now. Two are currently under study in the United States. However, attention currently focuses on the Swedish PIUS [expansion unknown]. Professor Colombo, can this reactor be proposed to the general public?

[Colombo] We have launched joint ventures (involving Italian industry) with General Electric and Westinghouse in the United States and with ABB Atom in Europe. The two American companies are developing a boiling water reactor, and the AP-600 pressurized water reactor respectively. Both are of medium size (600 MW), with extremely more simplified plants, and decidedly innovative solutions where safety is concerned.

ABB Atom is currently studying PIUS, which is a pressurized water reactor. This is an entirely new concept where safe operations are based on the reactor's inherent self-adjustment capacity without requiring active intervention systems. The distinguishing feature of the PIUS project is the immersion of the core and the entire primary circuit in a cold tank at the same pressure as the refrigerating circuit. This solution eliminates the problem of a breakdown in the primary circuit at the source. The reactor's emergency shut off is guaranteed by the spontaneous entry of borate water into the core

which generally occurs in disturbed conditions of any kind. This element confers a high degree of intrinsic safety to the whole project.

The principle has met with the approval of scientists and the theoretical project has been judged worthy of development. However, it will be necessary to demonstrate that the reactor can work without too many stumbling-blocks. To prove this, a prototype must be built to demonstrate the plant's feasibility and working capability.

The International Energy Agency in Vienna is proposing smaller, passively safe reactors with containment dikes to block radioactive emissions (or leaks in irrelevant quantities as far as health is concerned) even in case of serious accidents, as the path toward "new nuclear energy."

Decrease Accidents, Avoid Evacuations

[ITALIA OGGI] But is this the right path?

[Colombo] On the one hand our approach aims to drastically reduce the risk of a serious accident occurring within the reactor by introducing simplified plant operations and a high degree of intrinsic and passive safety. On the other hand, we are trying to develop a containment system that can contain the radioactivity freed from the fuel within the reactor itself, even in case of serious accidents (including the fusion of the core). Outside, therefore, there would be no appreciable radioactive consequences at all. In other words, it would not be necessary to evacuate the population and the territory and agricultural products would not be contaminated. This last feature definitely represents the major safety goal that we wish to achieve with new nuclear technology, and it is a goal that holds particular importance in a country as densely populated as Italy.

[ITALIA OGGI] In other words, has the time come to appeal for a new trial on nuclear energy?

[Colombo] An immediate return to nuclear energy in Italy seems rather improbable. I do, however, emphasize the fact that whatever the political decision on present day power plants, our research focuses on new generation reactors. Within three years, the program now under way should enable us to choose the reactor model on which to concentrate our development efforts. The subsequent program, which can be formulated only hypothetically at present, could lead to the definition of a detailed plant project by 1996, and the development of the first in a series of power plants in the following six or seven years. After all a construction plan for new generation nuclear power plants in Italy could reasonably be launched at the beginning of the next century. The temporary outlook for fusion, however, is much further ahead than for new generation reactors. We feel that a commercially competitive prototype of a fusion reactor will be possible in the year 2040. This is a very long term goal but one that needs to be pursued with determination.

Research on soft energy, defining the rules for the use of fossil fuels, and more studies on sophisticated nuclear energy, without giving up the idea of creating fusion, are a distant hope, but not a dream. These are Prof. Colombo's practical recipes for Italy, which cannot allow itself to be kept in the dark. However, among the many problems, this is also a simple but severe appeal to save energy. Italy, turn off that light.

Electric Power Company

91MI0178B ITALIA OGGI in Italian 10 Jan 91 p 33

[Text] Love you, hate you. Fortunately, this is no longer so: the nuclear issue is no longer a matter of irreconcilable hate or blind faith, at least not like it used to be. Reactors proliferated in Italy as in a large part of the world, working quietly until the Three Mile Island and Chernobyl accidents.

These were, however, useful experiences. No longer could we accept the construction of atomic reactors as they were conceived of in the past. However, Italy's energy problems have remained essentially the same as they were in 1987, the year of Italy's big "no" in answer to the referendum on nuclear energy. Perhaps, these problems have even worsened. Our dependence on energy supplies is increasing and our electricity requirements have grown by 4.9 percent. Furthermore, 15 percent of our total energy supplies comes from abroad.

So, what should we do? We spoke with Professor Giovan Battista Zorzoli, an expert on energy problems and a member of ENEL's [National Electric Power Company] board of directors. He stated that the "new nuclear energy" is interesting. "ENEL has just set aside 70 billion lire over the next three years for research in the field of passively and intrinsically safe reactors. There are three main areas to explore here," he explained. "The first two are the two reactors under study in the United States and the third is the PIUS [expansion no given] project, which has been spoken of in recent days. At the end of the three years, perhaps we will be able to choose one of the three possibilities and decide on further developments."

But how can we overcome the "no" Italy gave to nuclear power with the referendum? "The generation of reactors we are now talking about, unlike the obsolete ones that have been closed down, will avoid the need for the evacuation of the population. Of course, accidents cannot be avoided. Radioactivity leaks from the power plant will, however, be excluded. Perhaps this will not change any ideological opposition, but it may change the degree of acceptance.

"On the other hand, even the Greens have very precise positions today. Therefore, not just any product will be proposed. The possibility of recycling fission products in those plants where they are produced is being examined. I would also add that these proposals are not going to be developed tomorrow, or the day after, but on the

dawning of the year 2000." What energy must we therefore use from now until the end of the century? "A large deal of methane gas," Zorzoli explained. "petroleum with a low sulphur content, and a little coal with geothermal and hydroelectric energy being developed to the maximum."

Professor Sergio Barabaschi in charge of Ansaldo's research and the vice director of this large Genoa-based company which is strongly committed to the energy sector, explains that the studies on the PIUS project will be further investigated by the ABB-Ansaldo-Fiat consortium: "PIUS has many intrinsic safety features with interesting solutions, and meets the requirements dictated by Fermi: It is immersed in a pool of water and boron that can prevent combustion. There is also an intrinsic pressure-balancing mechanism so that any change whatsoever in optimal conditions automatically brings about the shut down of the reactor."

New scientific arguments, therefore, against consolidated positive experiences and against the fears that grew from two serious accidents, Chernobyl and Three Mile Island. There are many other problems, minor ones fortunately, that it would take too long to list here. The nuclear question is opening up again. Let us listen.

NORWAY

Soviet Nuclear Waste Storage on Kola Deployed

LD0304155491 Helsinki Domestic Service in Finnish 0900 GMT 3 Apr 91

[Excerpt] [Announcer] New information has come to light in Norway about Soviet nuclear waste storage on the Kola peninsula. According to the Norwegian environment organization [Bellona], the Kola peninsula is a ticking time bomb because of nuclear waste from the Soviet Navy and outdated nuclear submarines. From Oslo, Ulla-Maria Johansen reports:

[Johansen] According to the newest information from Bellona, the Soviet Union has stored large amounts of nuclear waste from high octane nuclear submarines in front of Murmansk on the island of Kildin about 120 kilometers from the Norwegian border. According to Bellona, the nuclear wastes have been placed in corridors dug inside a mountain, from which they can escape to the Barents Sea and damage the fish stock in the area.

Knut Gussgaard, Norwegian Nuclear Observation Department director, and other Norwegian authorities say that they have no knowledge of the storage on Kildin island. However, the environment organization Bellona claims that the KGB confirmed the existence of these stores as early as last January. In addition to using Kildin island, it claims that the Soviet Union has stored nuclear waste—which is damaging to the environment—even closer to the Norwegian border, to Kilpyavr. According to Bellona, radioactive waste from nuclear icebreakers

has been stored here. Bellona proposes forming an independent international inspection committee to inspect the security of Soviet nuclear waste storage and it also proposes cooperation with Soviet authorities. [passage omitted]

SWEDEN

Poll Surveys Views on Nuclear Power

91WP0071A Stockholm DAGENS NYHETER
in Swedish 8 Mar 91 p 12

[Report from TT (Wire Service, Inc.): "Increased Support for Nuclear Power"]

[Text] Support for nuclear power continues to increase, even though a majority of the Swedish population still wants to phase it out. These are the results of the latest

public opinion poll on nuclear power from the Institute for Political Science at Gothenburg University.

The poll, which was taken last year, surveyed just over 1,500 people. A comparison with results from the previous year indicates that the group consisting of those people who want to phase out nuclear power by 2010 or sooner has diminished.

29 percent want nuclear power to be phased out after 2010, while almost the same number, 27 percent, do not want nuclear power to be phased out at all. Both of these views have gained several percentage points of increased support over the last year.

The percentage of people who are undecided with respect to the nuclear power issue is greater than before, 16 percent.

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